PRINCE EDWARD ISLAND DEPARTMENT
OF INDUSTRY

ANALYSIS OF THE ECONOMIC BENEFITS TO THE PROVINCE OF THE PROPOSED ADATS PLANT OF LITTON SYSTEMS CANADA LIMITED

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PRINCE EDWARD ISLAND DEPARTMENT OF INDUSTRY

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ANALYSIS OF THE ECONOMIC BENEFITS TO THE PROVINCE OF THE PROPOSED ADATS PLANT OF LITTON SYSTEMS CANADA LIMITED

EXECUTIVE SUMMARY

- The purpose of this study is to provide an analysis of the potential fiscal and socio-economic implications for the Province of Prince Edward Island of the proposed Air Defence and Tank System (ADATS) plant. Of particular concern are the implications for the Provincial treasury in terms of changes in equalization entitlements, and to a lesser extent, changes in overall tax yields and expenditures for increased health and school services, and the effect of the plant on the longer term self-sufficiency of the Island.

- The construction and operation of the proposed ADATS plant would generate significant economic benefits for the Provincial economy. The first phase would provide 245 jobs at the plant, and an additional 427 jobs elsewhere on the Island. When the plant is fully operational, (Phase II), it would provide 345 jobs directly, and support an additional 487 jobs in Prince Edward Island indirectly for a total of 832 jobs. Total value added for Prince Edward Island amounts to $32.9 million, just under 50 per cent of the value added for Canada.

- Analysis of the Prince Edward Island labour force by occupational category and employment status indicates that the majority of jobs at the ADATS plant would be filled locally. However, given the specialized nature of the products, and the fact that some production now taking place in Ontario would be shifted to Prince Edward Island, it is estimated that 80 to 100 jobs would require relocation (in-migration) of workers to the Island. These would be primarily in the engineering occupations. The 487 jobs generated through the ripple effect would provide jobs for Island residents.

- The net effect is a substantial boost to the Province's employment growth rate with a corresponding decline in the unemployment rate. The unemployment rate in Prince Edward Island, without the ADATS plant, is forecast at 12.7 percent in 1987. Assuming Phase I of the ADATS plant comes on stream in 1987, the unemployment rate would decline by 1.3 per cent in that year to 11.4 per cent with increase in employment in Phase II in 1991, would decline to 8.9 percent, 1.6 percent below forecast levels. The plant's labour needs also fit well with the Province's education and skills training programs in the high technology area and incomes would be positively stimulated by the addition of the plant to the Island's economy.

- The labour force required for the operation of the proposed plant is estimated to bring about additional 320 people to Prince Edward Island by 1991. Many of these are expected to be former residents of the Island who left to seek employment opportunities in other provinces. This would stimulate up to 100 new housing starts since the housing market is tight at present. Coupled with the construction of the plant, this would bring a significant addition to capital stock. While this increase in population would increase the Provincial government's expenditures on education and health, the increases would likely be commensurate with current per capita spending on these services.

- Analysis of the effect on the Province's Equalization Entitlements indicates that depending on the size of the population influx and level of economic activity, Entitlements would decrease by 2.4 to 4.1 per cent, due to the increase in activity associated with Phase I. Phase II would increase this slightly, so that the overall effect is a decline of 2.6 to 4.6 per cent.

In absolute terms, this represents a decline of $3.0 million to $5.1 million was estimated to occur from the 1985-86 First Estimate of $125.2 million due to Phase I. A preliminary review of the overall fiscal impact on the Provincial treasury indicates that this decline will be more than offset by an increase in Provincial revenues from taxes and other sources.

- Agriculture is a major component of Prince Edward Island's gross domestic product. Compared to other provinces, Prince Edward Island ranks second to Saskatchewan in terms of the largest proportion of GDP in agriculture. The construction and operation of the ADATS plant on the Island will be a stimulus to the manufacturing sector, and would act as a catalyst toward the longer term restructuring the Island's economy. The increase in economic activity would be a positive step toward increasing the self-sufficiency of the Province in the longer term.

- Finally, our assessment of the economic implications for Prince Edward Island of the proposed ADATS plant indicates that the facility can be accommodated without major fiscal or economic disruption. Indeed, it will bring many substantial and positive economic benefits.

- The number of new plants of this nature and size which are seeking a Maritimes' location is limited. Given the economic benefits, the ADATS plant would be an appropriate one for the government of Prince Edward Island to attract to the Province.

I. INTRODUCTION

A. BACKGROUND

Litton Systems Canada Limited is considering the Province of Prince Edward Island as a location for its proposed Air Defence and Tank System (ADATS) plant. The government of Prince Edward Island is interested in securing this industrial plant because of the variety of spin-off benefits for the Provincial economy associated with the plant's construction and operation. The purpose of this study is to provide an analysis of the potential financial and socio-economic benefits of the ADATS plant for the Provincial economy. Of particular concern are the implications for the Provincial treasury in terms of changes in equalization entitlements. Changes in overall revenue yields, and requirements for additional expenditures to accommodate the increased population associated with the plant are also addressed. In addition, the economy of Prince Edward Island is relatively small and, therefore, the effect of the ADATS plant due to its level of employment and value of production, is significant in terms of its contribution to economic activity in the Province. This study also examines the impact of the proposed plant on the industrial structure of the Island and its contribution toward the longer term self-sufficiency of the Province.

B. HOW WE APPROACHED THIS ASSIGNMENT

In order to determine the potential impacts of the proposed ADATS plant on the Island's economy and Provincial treasury, we undertook two approaches.

The first approach utilized data generated from Statistics Canada's Interprovincial Input/Output Model. The Model is an integrated framework of economic statistics based on the interdependence of

economic sectors and industries, reflecting the structural relationships in the Canadian and provincial economies in 1979. The Model permits the measurement of the impacts of the two Phases associated with the establishment of the ADATS plant on the various economic sectors in each province.

The numbers generated by the Model should, however, be used with caution, for several reasons. First, the numbers provide only an estimate of the effects based on the level of detail associated with the inputs. In this case, the input data were rough approximations since the construction and operational requirements are not fully known in detail at this stage. Second, the Model does not make any adjustments for demand or supply effects, or for substitution or productivity improvements. Third, the analysis is based on the economic relationships prevailing in 1979, although changes have taken place in the subsequent six years. These cannot be readily factored into the Model outputs, but would not substantially alter the conclusions.

Nonetheless, the Model provides a 'snapshot' of the economic impacts of the proposed plant in terms of person-years of employment, value added directly by the plant to the economy, indirect value added due to the ripple effects of respending, and the associated government tax revenues.

Three Model runs were undertaken: one for the construction phase and two for each of the operating phases. The economic activity associated with the construction phase is a one-time event, whereas that associated with the plant's operation is sustained on an annual basis, from 1987 to until 1991 for Phase I, and boosted again thereafter, when the plant is fully operational (Phase II).

The Model results from the operating phases provide important data for use in the analysis of the economic and fiscal implications of the plant for the Province of Prince Edward Island.

A second approach was used to estimate the broader macro-economic impacts of the plant's establishment for Prince Edward Island. Utilizing The Coopers & Lybrand Consulting Group's provincial economic models, we have applied the changes in population, employment, residential and non-residential construction activity to determine the effect on key economic indicators including unemployment, housing starts, and Gross Provincial Product.

Due to the uncertainties associated with the plant, we developed three scenarios to test the sensitivity of the results to variations in input assumptions. The major difference among the three scenarios is the level of in-migration of population associated with the plant and high and low ranges for the economic variables. Employment at the plant at start-up in 1987 would total 245. The increased direct labour requirement in Phase II (1991) of the ADATS plant is 100 employees, bringing total employment to 345. Of these, 71 are professional engineers and 73 are engineering technologists. Based on information from Litton Systems Canada Limited and on the analysis of the labour market in Prince Edward Island, it was assumed that the number of employees at the plant who are currently residents would range from 245 to 295. That is, between 50 and 100 employees would migrate to the Province. The population levels based on these employment ranges vary from 150 to 400, and these form the population basis of the 'low' and 'high' cases, respectively.

In addition, the macro-economic forecast served as a check against the numbers generated by the Input/Output Model, which were used to calculate revenue changes. This check confirmed the use of the 'central' case as the preferred scenario for the analysis of the effect of the ADATS plant on the Provincial economy. In order to compare expenditures and revenues over time, current dollars are converted to constant or real dollars. All adjustments are based on the Implicit Price Index for Gross National Expenditure (GNE).

In total, six key areas of financial and economic impact were identified by the Provincial government. The results of the analysis are presented for each of the following areas of impact:

- labour market,
- demand for housing,
- health and education services,
- equalization entitlements,
- other tax revenues, and
- long term economic self-sufficiency.

II. UPDATE OF THE MACRO-ECONOMIC IMPACT ANALYSIS

In May 1985, Coopers & Lybrand/The Coopers & Lybrand Consulting Group undertook a macro-economic impact analysis of the proposed ADATS plant using Statistics Canada's Interprovincial Input/Output Model. Data for the analysis were provided by Litton Systems Canada Limited in April 1985 and the results of the analysis of the construction and operation of the plant were presented in a separate report entitled, "Economic Impact Analysis for the Construction and Operation of an ADATS (Air Defence and Tank System) Plant on Prince Edward Island". Since the publication of that report, Litton has refined some of the impact data pertaining to the plant. These changes are as follows:

- Adjustment of the number of employees at the ADATS plant.
- $15 million of the plant's sales are existing sales shifted from one of Litton's plants in Ontario.

TABLE 1A

THE ECONOMIC IMPACT OF PHASE I OF THE OPERATION OF THE PROPOSED ADATS PLANT AND FACILITIES ON PRINCE EDWARD ISLAND AND OTHER SELECTED PROVINCIAL ECONOMIES

Gross benefits generated by the project:	Prince Edward Island	Quebec	Ontario	Other Provinces & Territories	Canada*
Employment of paid employees:					
• Direct (associated with the wages and salaries paid by the project)	245	-	(15)	-	230
• Indirect (associated with industries supplying the project)	427	250	408	250	1,335
TOTAL	672	250	393	250	1,565
Total income/value added in thousands of 1985 dollars:	25,797	9,115	19,983	10,862	65,759
Gross production/shipments in thousands of 1985 dollars:					
• Primary industries	433	273	546	1,316	2,568
• Manufacturing industries	537	4,424	6,089	3,573	14,623
• Construction industry	195	81	228	161	666
• Service industries	9,473	3,769	7,345	5,216	25,798
TOTAL**	10,637	8,548	14,208	10,265	43,655

* Includes the Yukon and Northwest Territories.
** Totals may not add due to rounding.

Source: Statistics Canada, Interprovincial Input/Output Model, 1979.

TABLE 1B

THE ECONOMIC IMPACT OF THE OPERATION OF THE PROPOSED ADATS PLANT AND FACILITIES ON PRINCE EDWARD ISLAND AND OTHER SELECTED PROVINCIAL ECONOMIES (PHASES I AND II)

Gross benefits generated by the project:	Prince Edward Island	Quebec	Ontario	Other Provinces & Territories	Canada*
Employment of paid employees:					
• Direct (associated with the wages and salaries paid by the project)	345	-	(15)	-	330
• Indirect (associated with industries supplying the project)	487	264	371	275	1,397
TOTAL	832	264	356	275	1,727
Total income/value added in thousands of 1985 dollars:	32,900	9,617	13,931	11,769	68,217
Gross production/shipments in thousands of 1985 dollars:					
• Primary industries	946	545	945	2,430	4,866
• Manufacturing industries	1,942	11,689	17,029	10,103	40,563
• Construction industry	754	217	408	460	1,839
• Service industries	25,145	6,783	10,544	10,181	53,553
TOTAL**	28,687	19,234	28,926	23,174	100,021

* Includes the Yukon and Northwest Territories.
** Totals may not add due to rounding.

Source: Statistics Canada, Interprovincial Input/Output Model, 1979.

The effects of Phases I and II using input/output analysis are shown in Tables 1.A and 1B.

The analysis indicates that the economy of Prince Edward Island will benefit more than any other provincial economy from the operation of the ADATS plant and facilities. When in full operation, Prince Edward Island will receive 50 per cent of the employment, 48 per cent of the income and 29 per cent of the production/shipments benefits resulting from the plant's operation. These benefits accrue primarily to the Island's service sector. The manufacturing sectors of the Canadian economy, centred primarily in Ontario and Quebec, will also receive significant spin-off benefits from the plant operation.

These outputs from the Model provide an employment multiplier of 1:2.7 in Prince Edward Island due to Phase I of the plant.

III. IMPACT ON THE LABOUR MARKET

The ADATS plant will provide 86 construction jobs and an additional 41 jobs in related industries during its construction phase. Operation of the plant would employ 245 workers directly increasing to 345 by 1991, and create an additional 487 jobs through the Province. Additional jobs will be generated by the estimated 50 to 100 new housing starts required to meet housing demand for new residents by Phase II.

The labour force in Prince Edward Island totalled 55,670 in 1984. Without the ADATS plant, this is forecast to grow to a level of 62,800 by 1991. Employment in 1984 totalled 48,500 resulting in an unemployment rate of 12.8 per cent. In the absence of the plant, employment is currently forecast to grow by 7.0 per cent by 1987, with an associated unemployment rate of 12.7 per cent. The addition of over 800 new jobs is significant, given the size of the labour force.

TABLE 2

JOB CREATION AT THE ADATS PLANT

JOB CREATION

	Total	A	B	C	D	E
Assembly - Mech. & Electronic Technicians	56	11	45			
Test & Buy Off - Test Technicians	18	4			10	4
Quality Assurance	11	5	6			
Manufacturing Engineers	11			4	3	4
Sustaining Engineers	8					8
Assy., Test & Rework Support	6			3	2	1
Quality Engineers	2					2
Final Inspectors	3			1	2	
Receiving Inspectors	19	4	11		4	
Supplier Quality Engineers	4				2	2
Direct Total	**138**					
Engineers for Program Development	100				50	50
Indirect Support Personnel	65					
Maintenance Traces/Janitors/Drivers/ Security/Communications/Marketing/ Program Mgt./Finance/Secretarial/ Training/Health & Safety/etc.						
Canadian Forces	10					
Sub-Contractor Reps.	8					
Machine Shop (Contract or In-House)	6					
Repair & Overhaul	10					
Cafeteria Contract	8					
	345					

71 Professional Engineers

73 Diploma Technologists

8 Vocational Training School Graduates

62 Unskilled Trained

24 Trade Skilled

A - Trade Skilled
B - Unskilled Trained
C - Vocational Training School Graduates
D - Diploma Technologists
E - Professional Engineers

Source: Litton Systems Canada Limited

The occupational type and number of employees required for the ADATS plants are set out in Table 2. Of the 345 positions, professional engineers and engineering technologists account for 144. The way in which these positions are filled will have an important bearing on the number of new residents who will move to the Province, as the balance of positions are readily filled by the Island's labour force. Discussions with the company indicated that some proportion of these positions would be filled by transferring present employees to the Island since about 30 per cent of the plant's output is a transfer of production currently taking place in Ontario.

A review of unemployment insurance claims for the period April 1984 to March 1985, indicates that, on average, a total of 44 persons with engineering backgrounds are unemployed. This total is disaggregated by type of engineer in Table 3.

The Province's two post-secondary institutions offer courses in engineering and technology programs relevant to the ADATS plant's skill requirements. A survey of graduates and their employment indicates that most graduates in these programs are employed. The relatively high number of non-respondents must be taken into account, however, before suggesting that the labour market in these fields is tight. Discussions with staff at the Engineering Department at the University of Prince Edward Island and with the Association of Professional Engineers indicated that many graduates leave the Island for lack of employment opportunities.

Based on this information, it is estimated that between 50 and 100 of the 345 positions at the ADATS plant would be filled by people who are not currently residents of the Province. It is also likely that the plant would be able to attract engineers and technologists who left the Island to seek employment elsewhere. The other 487 jobs generated through the 'multiplier' or 'ripple' effect in the Island's economy are expected to be filled by residents of the Island.

TABLE 3

OCCUPATIONAL CATEGORIES RELEVANT TO THE ADATS PLANT REQUIREMENTS

Monthly Average of Unemployment Insurance Claimants in P.E.I.

April 1984 to March 1985

Occupation	Number of U.I. Claimants
Electrical Engineers	2
Industrial Engineers	1
Mechanical Engineers	2
Engineering Technologists and Technicians	33
Electronic Equipment Fabricating and Assembling Occupations	2
Inspecting and Testing - Electrical, Electronic, and Related Equipment	4
Total	44

Source: Canada Employment Office, Charlottetown, P.E.I.

TABLE 4

AVERAGE ANNUAL HOUSING VACANCY RATES

CANADA AND PRINCE EDWARD ISLAND

Year	P.E.I.	Canada
	%	%
1980	3.93	4.54
1981	3.40	3.86
1982	2.35	3.16
1983	1.94	2.85
1984	1.63	2.45
1985	1.81	2.10
1986	1.78	2.01
1987	1.73	2.09

Source: Statistics Canada, Housing Starts and Completions, 64-002. Projections - Economics Practice, The Coopers & Lybrand Consulting Group.

TABLE 5

PRINCE EDWARD ISLAND HOUSING STARTS 1980-1984

Year	Single	Multiple Unit	Total
1980	348	127	475
1981	201	2	203
1982	179	69	248
1983	380	293	673
1984	416	227	643

Source: Statistics Canada, Housing Starts and Completions, 64-002.

Taken together, the direct and indirect impact of Phase I of the ADATS plant on employment will have the effect of reducing the unemployment by 1.3 per cent to 11.4 per cent for the 1987 period, against the currently forecast level of 12.7 per cent. This would be accompanied by a further decline in the unemployment rate to 9 per cent in 1991, due to Phase II, 1.5 per cent below forecast levels.

IV. INCREASED DEMAND FOR HOUSING

The housing market in Prince Edward Island is currently very tight, as shown in Table 4. Housing starts declined significantly during the recession years of 1981 and 1982. New housing construction picked up sharply in 1983, growing by 171 per cent over 1982 levels, as shown in Table 5. Nonetheless, vacancy rates have continued to fall to very low levels. This has coincided with a rise in population due to natural increase and a net increase in in-migration to the Province during 1983 and 1984. Vacancy rates were pushed well below the 2 per cent level to 1.6 per cent in 1984 or, in absolute terms, about 630 dwelling units. This does not represent a wide selection to choose from. Apart from quality and desirability, there will also be problems with suitable proximity to the job site.

Our analysis of the Provincial housing market, without the addition of the ADATS plant, forecasts total housing starts ranging from 475 to 600 units annually between 1985 and 1991. This is the 'Current Forecast' shown in Table 6. Vacancy rates are expected to remain below the 2 per cent level until the mid-1990's.

TABLE 6
IMPACT ON HOUSING STARTS

	Current Forecast	High Case	Low Case
1985	580	580	580
1986	495	495	495
1987	540	590	590
1991	585	640	625

Source: Economics Practice, The Coopers & Lybrand Consulting Group.

TABLE 7

PRINCE EDWARD ISLAND
PRIMARY AND SECONDARY EDUCATIONAL EXPENDITURES 1980-1985

Year	Expenditures Current Dollars ($000s)	Expenditures Constant 1971 Dollars ($000s)	Enrolments	Real Expenditure Per Enrolment 1971 dollars
1980	53,254	23,585	27,027	872.6
1981	60,523	24,238	26,658	909.2
1982	66,826	24,256	26,049	931.2
1983	74,305	25,614	25,596	1000.7
1984	77,326	25,922	25,356	1022.3
1985	72,219	23,694	25,048	945.9

Source: Province of Prince Edward Island, Eleventh Annual Statistical Review, March, 1985
P.E.I. Budget Estimates, 1985.

The addition of the ADATS plant with its associated labour force requirements can be expected to further stimulate the housing market on the Island. Given the very low vacancy rates, the population increase associated with the plant will generate a level of housing starts commensurate with the number of new households.

This would raise new housing starts by 50 to 100 units in the 1987 to 1991 period, bringing total new housing starts during this period to a range between 590 and 640 units depending on the level of in-migration.

V. EFFECT ON HEALTH AND EDUCATION EXPENDITURES

This section reviews the potential effect of the establishment of the ADATS plant on the Province's expenditures for health care and education. These two expenditure categories were singled out because the Province has a somewhat limited range of educational services and health services relative to other provinces. In particular, concern was expressed that an influx of population from other provinces with a higher level of these services could lead to demands for improved education and health services, and thus increase Provincial expenditures in these areas.

A. EDUCATION SERVICES

The Province of Prince Edward Island offers 12 grades of elementary and secondary schooling. A child development program is available on a limited basis, but a kindergarten program is not generally available in the Province's elementary schools.

Enrolment in primary and secondary schools and education expenditures for the period 1980 to 1985 are shown in Table 7. As in other provinces, total enrolments have been declining over time due to the decline in population of school age. The number of enrolments per thousand population has dropped from 222 in 1980 to 200 in 1985. Based on the demographic profile of the Province's population, this decline is expected to continue, although at a slower rate.

Despite the decline in school population, real expenditures per enrolment continued to rise until the 1983/84 school year. In 1985 however, real expenditures per enrolment dropped sharply from $1,022 to $946. The 1985/86 Budget Estimate indicates a small real decline in education expenditures for the upcoming fiscal year, indicating that per enrolment expenditures will be flat or declining in future years.

An estimate of education expenditures associated with the new population by Phase II, assuming current levels of school services, has been made, based on the following assumptions:

- new population of 150 to 400,
- ratio of 200 enrolments per 1,000 population and
- no real increase in expenditures per enrolment.

The level of school enrolments would increase by 30 to 80 students. The resulting increases in expenditures for the new population are estimated to be:

	Thousands of $1985
Central Case	$184.3
Low Case	86.4
High Case	230.4

From the Province's perspective, there are two additional concerns about the impact of the establishment of the ADATS plant on the Island:

- new residents to the Island may demand a higher level of education services including kindergarten, junior kindergarten and special education (e.g., French immersion),

- the new population and the associated housing requirements may also result in new school construction although some existing schools are under-utilized due to declining enrolments.

TABLE 8

PRINCE EDWARD ISLAND
SELECTED HEALTH CARE STATISTICS

	1979/80	1980/81	1981/82	1982/83	1983/84
Active Treatment Beds	678	678	682	680	690
Population/Bed	180	181	180	181	180
Patient Days/Capita	1.52	1.53	1.54	1.55	1.60
Physicians/1000 Population	1.14	1.15	1.16	1.11	1.26
Physician Claims/Capita	4.6	4.5	4.5	5.0	5.00
Cost/Capita (1971 $)	35.05	36.38	37.01	40.91	41.32
Total Health and Hospital Expenditures ($000s)					
Current Dollars	38,702	47,483	55,283	69,921	76,712
Constant 1971 Dollars	19,093	21,029	22,140	25,380	25,716
$ Per Capita (Constant 1971 Dollars)	156.5	171.2	180.7	206.8	207.6
Out-of-Province Expenditures as a Per Cent of Total	9.9	9.6	12.7	12.0	11.8

Source: Province of Prince Edward Island, Eleventh Annual Statistical Review, March, 1985, P.E.I. Department of Health and Social Services, and Health and Hospital Services Commissions, Annual Reports; Public Accounts In the Province of Prince Edward Island for the years ended March 31st, 1980, 1982 and 1984.

Both are important issues from an expenditure point of view. It is, however, difficult to provide a quantitative analysis of the costs of these demands.

The level of additional enrolments as a result of the ADATS plant by Phase II is small. An additional 30 to 80 students is less than 1 percent of current enrolments. Dispersed through 12 school years, these alone would be too small a number to justify additional services.

Similarly, with respect to the issue of new school construction, the number of new students associated with the ADATS plant is too small to require additional school buildings. The population on the Island is increasing and in recent years has grown because of net in-migration. The construction of new housing for this general population increase in some areas may well necessitate the expense of either additional school construction, or bussing of students to fully utilize existing schools.

B. HEALTH CARE SERVICES

Selected health care statistics for the Province are shown in Table 8. Health care expenditures in real terms have been increasing over the period 1980 to 1985, particularly beginning in 1982.

At this time Queen Elizabeth Hospital opened, there was an increase in the number of physician services claims per capita, and an increase in the proportion of expenditures made for out-of-province health care. These increases in expenditures may also be related to the aging population or to an improvement in the quality of health services.

The available data provide a limited basis for estimation of future health care costs. The Provincial government has, however,

TABLE 9

PRINCE EDWARD ISLAND

EQUALIZATION ENTITLEMENTS 1980-1984

	Total Revenues	Equalization Entitlements	Entitlements as a Percentage of Total Revenues
	$ 000		%
1980	272,627.6	80,426	29.5
1981	304,690.9	89,999	29.5
1982	351,062.0	113,833	32.4
1983	373,925.9	121,743	32.6
1984	416,769.6	127,675	30.6

Source: Prince Edward Island, Public Accounts, 1980-1984.

expressed concern that new residents would have an impact on expenditures, particularly if they desired an increase in the quality of health care services. The Province has a limited number of specialist practitioners and therefore pays out-of-province expenses for services not available in Prince Edward Island. As with the concern for demands to improve education services, the number of new residents directly associated with the ADATS plant is relatively small. The Province should therefore be able to continue its policy of out-of-province health care financing until such time as overall population growth or other factors (e.g., changing age structure, etc.) indicate a need to change the level of health care services. On this basis, it would therefore be reasonable to assume that, on a per capita basis, health care costs for the new population would be commensurate with health care costs for the population as a whole.

VI. EFFECT ON THE PROVINCE'S EQUALIZATION ENTITLEMENTS

The ADATS plant would have a major impact on the Province's economy. As economic performance improves, the "Equalization Entitlements", which are based on an estimate of revenue generation capability, would fall. Equalization entitlements are a revenue transfer from the federal government to provinces which fall below a standard revenue generation capability. For the Province of Prince Edward Island, these revenues are important. As shown in Table 9, these entitlements account for about 30 per cent of total revenues to the Provincial government. Given a significant increase in economic activity, directly and indirectly due to the establishment of the ADATS plant, the government is concerned about the impact on entitlement revenues.

This section of the report provides an analysis of the effects of the ADATS plant operation on the Province's equalization entitlements through the increase in the overall level of economic activity in the Province associated with the two phases of the ADATS plant.

Equalization entitlements are based on 39 tax and revenue categories. In our analysis, we have attempted to provide a detailed analysis of the impact on the more significant categories. The details of the methodology and the calculations are contained in Appendix I.

Six categories out of the 39 were selected for detailed analysis either because of their relative contribution to total entitlements, or due to the significant impact which the ADATS plant would have on them. The six are expected to constitute 82 per cent of total entitlements in 1985/86, as follows:

	Per Cent
• personal income tax	35.8
• business income tax	5.8
• general and miscellaneous taxes	13.1
• hospital and medical insurance premiums	2.6
• provincial-local property tax	16.7
• miscellaneous provincial-local taxes	8.0
	82.0

The federal Department of Finance has developed a First Estimate for 1985/86 of equalization entitlements for the provinces. This First Estimate contains the detailed computational tables used for the formulation of the entitlements for each tax or revenue category. Based on discussions with the Department of Finance, simplified calculations were developed based on the key variables, in order to reduce data requirements. Data on levels of economic activity and population are required for each category. Population data inputs for this analysis were based on the levels of new population associated with the ADATS plant for the 3 scenarios, i.e, ranging from 150 to 400 new residents. Economic data requirements, as appropriate, were taken from the outputs of the Input/Output Model analysis. Data required to calculate the entitlement changes include changes in:

- population,

TABLE 10.A Phase I

PRINCE EDWARD ISLAND
EQUALIZATION ENTITLEMENTS
AS INFLUENCED BY
ADATS PLANT OPERATIONS

NO.	CATEGORY	1985-86 FIRST ESTIMATE	CENTRAL CASE	LOW CASE	HIGH CASE
1	PERSONAL INCOME TAX	44,831	43,758	43,950	43,566
2	BUSINESS INCOME	7,273	6,795	6,970	6,663
3	CAPITAL TAX	1,608	1,392	1,471	1,333
4	GENL & MISC SALES	16,345	15,629	15,930	15,344
5	TOBACCO	222	54	83	24
6	GASOLINE	422	175	218	132
7	DIESEL FUEL	2,032	2,007	2,011	2,002
8	NON-COMM VEHICLE LIC	368	276	292	260
9	COMM VEH LIC	392	354	361	347
10	SALE OF SPIRITS	(407)	(556)	(531)	(582)
11	SALE OF WINE	1,295	1,279	1,282	1,276
12	SALE OF BEER	449	391	401	381
13	HOSP & MEDICAL INSC	3,267	3,036	3,067	3,004
14	SUCCESSION DUTIES	211	211	211	211
15	RACE TRACK	154	144	146	142
16	FORESTRY	1,763	1,764	1,764	1,764
17	NEW OIL	111	111	111	111
18	NORP OIL	837	837	837	837
19	OLD OIL	1,542	1,543	1,543	1,543
20	HEAVY OIL	608	609	609	609
21	MINED OIL	0	0	0	0
22	DOM SOLD NAT GAS	622	622	622	622
23	EXPT NAT GAS	553	554	554	554
24	SALES CROWN LEASES	534	534	534	534
25	OTHER OIL AND GAS	147	147	147	147
26	MIN RES - IRON	62	62	62	62
27	MIN RES - URANIUM	166	166	166	166
28	MIN RES - ASBESTOS	0	0	0	0
29	MIN RES - COAL	236	236	236	236
30	MIN RES - OTHER	625	625	625	625
31	POTASH	543	544	544	544
32	WATER POWER	1,898	1,900	1,900	1,900
33	INSURANCE PREMIUM	887	845	850	839
34	PAYROLL	3,624	3,530	3,547	3,513
35	PROV-LOCAL PROPERTY	20,948	20,965	20,965	20,965
36	LOTTERY	970	928	935	920
37	MISC PROV-LOC TAXES	10,024	9,592	9,713	9,499
38	SHARED REV: UNDIST LAND INC	0	0	0	0
39	SHARED REV: OFF-SHORE	0	0	0	0
40	TOTAL EQUALIZATION ENTITLEMENTS	125,162	121,060	122,128	120,096
	CHANGE IN EQUALIZATION ENTITLEMENTS FROM BASE	0	(4,102)	(3,034)	(5,066)
	PER CENT CHANGE IN ENTITLEMENTS FROM BASE		-3.28	-2.42	-4.05

- personal income tax payments,
- corporate profits before taxes,
- total retail sales,
- the number of persons capable of paying full hospital and medical insurance premiums,
- net Provincial Income at factor cost, and
- non-residential capital stock.

Tables 10.A and 10.B show the resultant calculations of equalization entitlements for each of the 3 scenarios for Phases I and II respectively. The federal Department of Finance First Estimate is shown for comparative purposes.

The decline in Equalization Entitlements associated with Phase I of the ADATS plant is estimated to range from $3.0 to 5.1 million, or 2.4 to 4.1 per cent. The central case is a decline of $4.1 million or 3.3 per cent in Entitlements below estimated 1985/86 levels.

The full effect of the establishment of the ADATS plant by 1991, through its overall positive impact on the level of economic activity, would reduce the Province's equalization entitlements below 1985/86 levels in total by an estimated 2.6 per cent to 4.6 per cent. The variation reflects the differences in assumptions for economic activity. In absolute terms, the revenue loss for the Province ranges from $3.3 million to $5.8 million, or between 0.7 and 1.3 per cent of the Province's total estimated revenues for 1985/86 of $446.9 million.

The decline in entitlement for the two phases of the plant are summarized below:

TABLE 10.B

Phase II

PRINCE EDWARD ISLAND
EQUALIZATION ENTITLEMENTS
AS INFLUENCED BY
ADATS PLANT OPERATIONS

NO.	CATEGORY	1985-86 FIRST ESTIMATE	CENTRAL CASE	LOW CASE	HIGH CASE
1	PERSONAL INCOME TAX	44,631	43,600	43,842	43,337
2	BUSINESS INCOME	7,273	6,794	6,978	6,663
3	CAPITAL TAX	1,608	1,389	1,471	1,330
4	GENL & MISC SALES	16,345	15,551	15,920	15,197
5	TOBACCO	222	18	55	(22)
6	GASOLINE	422	123	177	64
7	DIESEL FUEL	2,032	2,005	2,010	1,998
8	NON-COMM VEHICLE LIC	368	257	277	235
9	COMM VEH LIC	392	347	355	337
10	SALE OF SPIRITS	(407)	(589)	(556)	(624)
11	SALE OF WINE	1,295	1,278	1,281	1,274
12	SALE OF BEER	449	379	392	366
13	HOSP & MEDICAL INSC	3,267	3,000	3,036	2,961
14	SUCCESSION DUTIES	211	212	212	212
15	RACE TRACK	154	142	145	140
16	FORESTRY	1,763	1,767	1,767	1,767
17	NEW OIL	111	111	111	111
18	NORP OIL	837	839	839	839
19	OLD OIL	1,542	1,546	1,546	1,546
20	HEAVY OIL	606	610	610	610
21	MINED OIL	0	0	0	0
22	DOM SOLD NAT GAS	622	624	624	624
23	EXPT NAT GAS	553	555	555	555
24	SALES CROWN LEASES	534	535	535	535
25	OTHER OIL AND GAS	147	147	147	147
26	MIN RES - IRON	62	63	63	63
27	MIN RES - URANIUM	166	166	166	166
28	MIN RES - ASBESTOS	0	0	0	0
29	MIN RES - COAL	236	236	236	236
30	MIN RES - OTHER	625	626	626	626
31	POTASH	543	545	545	545
32	WATER POWER	1,898	1,903	1,903	1,903
33	INSURANCE PREMIUM	887	839	846	831
34	PAYROLL	3,624	3,516	3,537	3,493
35	PROV-LOCAL PROPERTY	20,948	21,001	21,001	21,001
36	LOTTERY	970	920	929	910
37	MISC PROV-LOC TAXES	10,024	9,553	9,692	9,423
38	SHARED REV: UNDIST LAND INC	0	0	0	0
39	SHARED REV: OFF-SHORE	0	0	0	0
40	TOTAL EQUALIZATION ENTITLEMENTS	125,162	120,609	121,877	119,400
	CHANGE IN EQUALIZATION ENTITLEMENTS FROM BASE	0	(4,553)	(3,285)	(5,762)
	PER CENT CHANGE IN ENTITLEMENTS FROM BASE		-3.64	-2.62	-4.60

Source: Federal-Provincial Relations Division, Dept. of Finance:
PROVINCIAL FISCAL EQUALIZATION: FIRST ESTIMATE 1985-86
Case estimates by CURRIE, COOPERS & LYBRAND

Decline in Equalization Entitlements

	Central Case	High Case	Low Case
Phase I	$4.1 mm 3.3%	$5.1 mm 4.1%	$3.0 mm 2.4%
Phase II	$4.6 mm 3.6%	$5.8 mm 4.6%	$3.3 mm 2.6%

In developing these estimates, we also examined the sensitivity of the results to variations in the population and economic indicators. In all cases, the results show a greater sensitivity (or variation) to changes in the economic variables than to changes in population.

VII. IMPACT ON OTHER PROVINCIAL REVENUES

This section of the report examines potential government revenue increases that may occur as a result of the establishment of the ADATS plant in order to provide a perspective on the net effect of the estimated declines in equalization entitlements for the Province. The calculations of entitlement changes in Section VI have been made using 1985/86 data. For comparability, the 1985/86 revenue base set out in the Prince Edward Island Budget Estimates for the fiscal year ending March 31, 1986 has been used to estimate the other revenue effects on the Provincial treasury. The five main categories of revenues and their respective shares of total revenues are shown in Table 11. In this section, we provide estimates of the increase in revenues in four of the five categories, resulting from the effects of the ADATS plant, when in full operation. Investment revenue changes are not estimated.

TABLE 11
REVENUE CATEGORIES AND THEIR CONTRIBUTION TO TOTAL PROVINCIAL REVENUES

Revenue Category	1985/86 Budget Estimate $000's	Percent of Total Provincial Revenues %
Taxes	178,265.5	77.1
Sales	14,181.7	6.1
Licenses and Permits	4,609.0	2.0
Fees and Services	7,559.5	3.3
Investments	26,455.0	11.4
	231,070.7	100.0

Source: Province of Prince Edward Island, Budget Speech and Estimates, 1985, pp. 10-11.

A. TAX REVENUES

Four important categories of tax revenues (personal income, business income, sales and property taxes) were targetted in the analysis of the effect on the Province's equalization entitlements. These four categories account for 81.3 per cent of the Province's total tax revenues, and 62.7 per cent of total Provincial revenue as shown in Table 12.

The calculations of changes in tax bases affecting equalization entitlements for these four categories have been used to develop estimates of actual tax revenue changes for these four categories.

TABLE 12

TAX REVENUES: 1985/86 ESTIMATES

Tax Category	1985/86 Revenue $000s	Share of Total Taxes %	Share of Provincial Revenues %
Personal Income	53,948	30.3	23.3
Corporate Income	8,033	4.5	3.5
Sales	64,825	36.4	28.1
Property	18,000	10.1	7.8
Total	144,806	81.3	62.7

Total Tax Revenues $178,265.5

Total Provincial Revenues $231,070.7

Note: Percentage details may not add to totals due to rounding.

Source: Province of Prince Edward Island, Budget Speech and Estimates, 1985, p. 10.

TABLE 13

PRINCE EDWARD ISLAND

PER CENT CHANGES IN TAX BASES AS INFLUENCED BY VARIATIONS IN ECONOMIC ASSUMPTIONS

Tax Base	Central Case	Low Case	High Case
Personal Income	2.6	2.2	3.1
Corporate Income	6.7	4.3	8.4
Retail Sales	2.5	1.5	3.4
Property	1.9	1.3	2.5

Source: For details, see Appendix I.
Economics Practice, Currie, Coopers & Lybrand

Percentage changes in the tax bases for these categories based on estimated variations in the contributing economic variables, as detailed in Appendix I, are shown in Table 13. The 'central case' has been used to estimate the increase in revenues and the percentage changes from the 1985/86 estimates in these categories due to the proposed ADATS plant. These are shown in Table 14. Increases in revenues in these categories would raise total tax revenues by $3.9 million, or 2.2 per cent, based on the 'central case' assumptions. Tax revenue changes associated with the low and high cases range from $2.7 million (+1.5 per cent) to $5.0 million (+2.8 per cent) respectively.

TABLE 14

CHANGE IN TAX REVENUES

	Revenue Increase* $000s	Per Cent Change %
Personal Income	1,421	2.6
Corporate Income	535	6.7
Sales	1,593	2.5
Property	349	1.9
	3,898	

Source: Table 12
* Based on 'central' case.

TABLE 15

PRINCE EDWARD ISLAND PROVINCIAL GOVERNMENT REVENUE TRENDS 1980-1984

Revenue Category	1980*	1984*	Per Cent Change Per Annum 1981 - 1984	
	- 000's $Current-		Current $	Constant $
			- - - - Per Cent - - - -	
TAXES				
Personal Income	30,976	48,403	11.8	4.3
Corporate Income	4,515	7,786	14.6	6.9
Sales	29,236	55,302	17.3	9.4
Property	10,952	17,073	11.7	4.2
Other	16,371	32,094	18.3	10.4
SALES	10,157	12,000	4.3	-2.7
LICENSES AND PERMITS				
Motor Vehicles	2,693	3,066	3.3	-3.6
Other	516	873	14.0	6.3
FEES AND SERVICES				
Patient Fees	2,332	3,891	13.7	6.1
Other (excluding Provincial Lab. Services)	2,022	2,726	7.8	0.6
GNE Deflator (1971 = 100)	225.8	298.2	7.2	
Population	122.8	125.6	0.3	

* Year ended March 31.

Source: Province of Prince Edward Island, Public Accounts 1982 and 1984, pages 59-60 and 69-70 respectively.

The remaining revenue categories account for 37.3 per cent of total Provincial revenues, and the construction and operation of the ADATS plant can also be expected to affect several of the more important revenue categories within this group, based on either the change in population or the change in economic activity. The historical changes in revenue in the major revenue categories based on the Provincial Public Accounts are shown in Table 15. Revenues are shown in current dollars, with rates of change in current and constant dollars.

Six categories of taxes account for the remaining 18.8 per cent of total tax revenues. Changes in these revenues over the 1980 to 1984 period are similar to the percentage changes in sales taxes since these are derived primarily from retail sales subject to taxes similar in form to sales tax, i.e., tobacco, liquor, gasoline and entertainment. The growth rate of these six tax revenue categories is higher than that of sales tax revenues due to an increase in tax rates in 1982.

The level of retail sales and, hence, sales tax revenues, are generally proportional to the overall level of economic activity. The change in revenues associated with these categories has been estimated based on two assumptions:

- no increase in tax rates will occur and
- revenues will grow at the same rate as sales tax revenues

Based on these assumptions, revenue increases for the remaining six tax categories are estimated to range from $0.5 million to $1.1 million. This would produce an increase in total tax revenues, for all 10 categories of between $3.2 million and $6.1 million.

B. SALES REVENUES

In contrast, the growth trend for sales revenues is negative during this time period. Liquor sales, which dominate the revenues in this category, declined sharply in 1982 in response to a large tax increase (from 10 to 25 per cent) and to recessionary economic conditions. If this one time adjustment to price increases is netted out, then liquor sales in the Province show real increases for the period. We have, therefore, assumed that sales revenues will grow at, or near the rate, associated with retail sales taxes. Thus, the increase in revenues generated by sales is estimated to range from $0.2 million $0.5 million.

C. LICENSE AND PERMIT REVENUES

License and permit revenues account for just under 2 per cent of total Provincial revenues in the 1985/86 estimates. Motor vehicle licenses and permits have historically accounted for the majority but declining share of total revenues in this category, ranging from 84 per cent in 1980 to 77 per cent in 1984. This decline is particularly interesting in light of the steady growth in vehicle registrations over the period, from 76,111 vehicles in 1980 to 80,271 in 1984. This represents an increase of 1.3 per cent per year.

While revenues from motor vehicles have declined in real terms since 1980, other license revenues have grown by 6.3 per cent annually. However, much of this growth is due to the sharp rise in 1981 of oil and gas licenses. Since then, these licenses have yielded declining revenues. This trend is expected to continue, according to the 1985/86 Budget Estimates. We have, therefore, based our forecast of license and permit revenues on the change in population associated with the ADATS plant. The population increase is modest and, hence, revenue growth is also estimated to be modest, ranging from $6,000 to $15,000.

TABLE 16

PRINCE EDWARD ISLAND
REVENUE CHANGES
AS INFLUENCED BY
ADATS PLANT OPERATIONS

Revenue Category	Central Case	Low Case	High Case
	----Thousands of 1985 dollars----		
TAXES			
Personal Income	1,421	1,189	1,672
Business Income	535	345	671
Sales	1,593	962	2,199
Property	349	230	450
Other	822	497	1,135
Total	4,720	3,223	6,127
SALES	348	210	481
LICENSES AND PERMITS	12	6	15
FEES AND SERVICES	19	9	24
TOTAL	5,099	3,448	6,647

Source: Economics Practice, The Coopers & Lybrand Consulting Group.

D. FEES AND SERVICES REVENUES

Fees and services revenues are estimated to contribute 3.3 per cent of total Provincial revenues during the 1985/86 fiscal year. Patient fees accounted for just under 60 per cent of this category in 1984. These patient fees, as shown in Table 15, have grown by 6.1 per cent annually in constant dollar terms over the 1980 to 1984 period. Other fees and services, excluding Provincial laboratory services, have grown at a much more modest pace, averaging 0.6 per cent annually.

As discussed in Section V, changes in health care expenditures in Prince Edward Island appear to be related to changes in the quality and level of service, rather than to changes in economic activity or population. This pattern of growth in health care expenditures can be expected to continue and the overall growth of patient fees associated with the ADATS plant is expected to increase proportionally to the growth in population associated with the plant. On this basis, total fees and services revenues are estimated to increase by between $9,000 and $24,000 over the current level, depending on the size of increase in population.

E. REVENUE SUMMARY

Finally, to complete the revenue analysis, it should be noted that revenue from investments is expected to remain unchanged by the establishment of the ADATS plant on the Island.

A summary of the revenue changes discussed in the foregoing sections is presented in Table 16. Based on our alternative cases, which have differing assumptions about the size of population increase directly associated with the ADATS plant and its effect on economic activity, revenues are estimated to increase by $3.4 million to $6.6 million over present 1985/86 estimates.

TABLE 17

PRINCE EDWARD ISLAND
COMPARISON OF REVENUE AND EQUALIZATION ENTITLEMENT CHANGES*

	Central Case	Low Case	High Case
		$000's	
Revenue Gains	5,099	3,448	6,647
Change in Equalization Entitlements	-4,710	-3,398	-5,961
Net Revenue Gain	389	50	686

* based on revenue estimates in the 1985/86 P.E.I. Budget

Source: Table 15 Section VII and
Table 10 Section VI (adjusted)

F. COMPARISON OF REVENUE AND EQUALIZATION ENTITLEMENT CHANGES

Revenue gains developed in the earlier part of this section are compared here to the changes in equalization entitlements set out in Section VI.

The revenue gains are based on the 1985/86 Budget Estimates for the Province of Prince Edward Island, while the detailed calculations of changes in entitlements are based on figures from the federal Department of Finance. The Province's Budget Estimate indicates expected equalization entitlements for the year ending March 31, 1986 to total $129.5 million. The First Estimates of the Department of Finance for the same period are somewhat lower, at $125.2 million.

In order to make the change in entitlements calculated in the federal base comparable with the change in taxes calculated in the Provincial Budget base, the ratio of Provincial to federal estimates of 1.034475 was applied to the entitlements change estimates calculated on the federal base. The adjusted estimates of entitlements change lie in the range of $3.4 million to $6.0 million with a 'central case' estimate of $4.7 million. Table 17 provides a comparison of the revenue gains to the loss in equalization entitlements for each of the 3 scenarios.

In all cases, the revenue loss associated with the change in equalization entitlements is more than offset by the gain in other Provincial revenues. While the low case shows a marginal gain in net revenue, it should be noted that the estimates of revenue gains are conservative, and the net change in revenues is therefore possibly understated.

TABLE 18

GROSS DOMESTIC PRODUCT AT MARKET PRICES
PRINCE EDWARD ISLAND
1984

	Gross Domestic Product	
	Constant 1971 Dollars	Per Cent Distribution
	$ Millions	Per Cent
Agriculture	38	9.6
Non-Agriculture		
Forestry	0	0.0
Fishing	11	2.8
Mining	0	0.0
Manufacturing	25	6.3
Construction	22	5.5
Transportation, Communications	32	8.1
Utilities	7	1.8
Trade, Retail, Wholesale	57	14.4
Finance, Insurance & Real Estate	46	11.6
Community, Business Services	81	20.4
Public Administration & Defence	78	19.6
TOTAL*	397	100.0
Goods Producing Industries	103	26.0
Service Producing Industries	294	74.0

* Per cent total may not add due to rounding.

Source: Conference Board of Canada estimates.

VIII. CONTRIBUTION OF THE ADATS PLANT TO THE LONGER TERM SELF-SUFFICIENCY OF PRINCE EDWARD ISLAND

The structure of the economy of Prince Edward Island coupled with its relatively small size mean that the establishment of an ADATS plant with its $21 million in capital investment and $50 million in annual sales will have a significant impact on both the economy as a whole as well as specific sectors. This section of the report examines these impacts and comments on the contribution of the plant to the longer term self-sufficiency of the Province of Prince Edward Island, based on the plant's Phase II fully operational level.

A. IMPACT ON GROSS DOMESTIC PRODUCT

Gross Domestic Product (GDP) measures the value of production from all sectors of the economy within the Province. GDP can be expressed in terms of market prices, which is the total value of goods and services produced for final sale, or in terms of factor cost, which reflects value-added by excluding intermediate goods and services used in the production process. Both measures of GDP have been utilized in this analysis due to the limited availability of accurate GDP figures on a Provincial basis, and to incorporate the data generated by the Interprovincial Input/Output Model analysis in terms of the impact on Prince Edward Island's GDP. In the case of Prince Edward Island, the differences between the two measures is small: GDP at market prices was about 6 per cent higher than GDP at factor cost in 1978. By 1983, this difference had risen to about 8 per cent.

Table 18 shows the distribution of GDP at market prices for the Province for 1984. For the Province, the proportion of goods producing industries is relatively small, at 26 per cent, compared to that of Canada as a whole, at 36 per cent. Indeed, the Province has the largest proportion of service producing industries of all the ten provinces, according to GDP estimates prepared by the Conference Board of Canada. Agriculture

TABLE 19

TOURIST EXPENDITURES ON
PRINCE EDWARD ISLAND

Year	Tourist Expenditure (millions of current dollars)	GDP (millions of current dollars)	Share of Tourism in GDP (Per Cent)
1978	32.7	665	4.9
1979	38.6	759	5.1
1980	43.5	859	5.1
1981	46.5	960	4.9
1982	49.5	1,039	4.8
1983	50.7	1,198	4.2
1984	54.2	1,255	4.3

Source: Province of Prince Edward Island, Eleventh Annual Statistical Review, March, 1985.

represents the largest sub-component share of goods producing industries, with 9.6 per cent of total GDP. Manufacturing has a moderate significance in the Prince Edward Island's economy with only a 6.3 per cent share of total output. The Provincial government's statement on economic goals and policies are clearly set out in a 1984 publication entitled Blending Tradition and Innovation. This strategy recognizes the roles of five sectors in the economy, stating the following goals for each:

- agriculture - maintenance of agriculture as the cornerstone of future resource development
- fisheries - improving competitiveness
- forestry - improvement of the resource base
- tourism - restoration of steady growth within the industry
- industry/ business - expansion of this sector by encouraging the establishment of new firms appropriate to the economy

The establishment of the ADATS plant is a good fit with the stated objective for industrial development. A realistic look at the Provincial economy and the objectives for this sector reinforces the point that the plant would be a significant boost to the economy, particularly if the goals for other sectors prove difficult to achieve. Real growth in several of the goods producing sectors has slowed or, as in the case of manufacturing, declined, in recent years. Tourist expenditures, as a proportion of GDP, have fallen from peak levels of 5.1 per cent in 1980 to 4.3 per cent in 1984, as shown in Table 19. Forestry's share of GDP is virtually non-existent.

TABLE 20

EFFECT OF THE ADATS PLANT OPERATION

ON PRINCE EDWARD ISLAND'S GROSS DOMESTIC PRODUCT

Millions of $ 1982

Sector	1982 GDP at Factor Cost $ Millions	Per Cent of Total %	Addition to GDP due to ADATS Plant $ Millions	Total GDP at Factor Cost $ Millions	Per Cent of Total %
Agriculture	81.7	8.5	0.5	82.2	8.3
Forestry and Hunting	0.3	0.03	0.0	0.3	.03
Fishing	25.0	2.6	0.0	25.0	2.5
Manufacturing	62.9	6.5	14.2	77.1	7.8
Construction	47.4	4.9	0.2	47.6	4.8
Utilities	20.8	2.2	1.7	22.5	2.3
Other Industries	480.9	50.0	12.2	493.1	49.8
Public Administration	81.6	8.5	0.0	81.6	8.2
Community Services	160.4	16.7	0.1	160.5	16.2
Totals*	961.0	100.0	28.8	989.8	100.0

Source: Statistics Canada: System of National Accounts, Provincial Economic Accounts Experimental Data, Cat. No. 13-213; System of National Accounts, Provincial Gross Domestic Product by Industry, Cat. No. 61-202; and Interprovincial Input/Output Model.

* Totals may not add due to rounding.

In this context, the impact of the ADATS plant is both large, in terms of total value-added to the Provincial economy, and significant, in terms of the stimulus it provides to specific economic sectors.

Table 20 shows the estimated impact of the ADATS plant operation on P.E.I.'s GDP. GDP at factor cost for 1982 has been used in order to allow the addition of the plant's impact as determined using the Input/Output Model. Production by sector at factor cost has been adjusted to 1982 dollars. A total of $28.8 million in value-added to the Province (adjusted from $32.9 million in 1985 dollars shown in Table 1) is generated by the establishment of the plant. This represents an increase in GDP of just under 3 per cent. By contrast, real growth in GDP averaged 2.4 per year over the period 1980 to 1984.

Table 20 also shows the direct and indirect value-added due to the plant factored into the relevant economic sectors. Particularly evident is the major boost to the manufacturing sector, which will grow by $14.2 million, of which $13.7 million is the value-added by the ADATS plant. GDP at factor cost for the plant is calculated using the sum of wages and salaries, and depreciation, totalling $15.6 million in 1985 dollars and adjusted using the GNE Implicit Price Index.

Manufacturing is thus the sector which benefits the most from the ADATS plant. Its share of GDP rises from 6.5 per cent to 7.8 per cent. The balance of the increase in GDP is spread among the other sectors and their shares of GDP all decline slightly. In total, the addition of the ADATS plant to the Provincial economy would provide a very major stimulus to GDP growth, and to the manufacturing sector in particular.

TABLE 21

ESTIMATED IMPACT OF THE ADATS PLANT ON SELECTED ECONOMIC INDICATORS

		Current Forecast	Low Case	Central Case
		---------- Per Cent ----------		
Unemployment Rate	1984	12.8	12.8	12.8
	1985	13.8	13.8	13.8
	1986	14.2	14.0	14.0
	1987	12.7	11.4	11.4
	1991	10.5	8.9	9.0
		------- Annual Per Cent Change -------		
Real Gross Provincial Product	1984	2.0	2.0	2.0
	1985	2.8	2.8	2.8
	1986	1.3	1.7	1.7
	1987	2.5	3.4	3.6
	1991	3.0	3.2	3.3
Real Disposable Income	1984	1.8	1.8	1.8
	1985	3.3	3.3	3.3
	1986	0.2	0.4	0.4
	1987	2.0	3.3	3.3
	1991	3.0	3.3	3.3
Real Disposable Income per Household	1984	0.4	0.4	0.4
	1985	1.8	1.8	1.8
	1986	-1.2	-0.9	-0.9
	1987	0.6	1.8	1.7
	1991	1.3	1.5	1.5

Source: Statistics Canada, National Accounts Data.
Forecasts by Economics Practice, The Coopers & Lybrand Consulting Group.

The growth stimulus of the plant is particularly important in view of the outlook for the P.E.I. economy through to 1995. Economic growth for the Province (without the plant) is forecast to be slower than the trend for Canada. Over the 1985 to 1995 period, real GNP growth in Canada is projected to average 2.3 per cent annually, while that of P.E.I. is projected to rise more slowly by about 1.9 per cent annually. Neither of these growth forecasts is particularly robust, but represent Canada's continuing difficulties in sustaining economic growth through increased success in meeting foreign competition.

B. IMPACT ON OTHER ECONOMIC INDICATORS

The combined effects of the increased economic activity and population due to the plant by Phase II have been analyzed in terms of their impact on the following economic indicators:

- unemployment rate
- real disposable income
- Gross Provincial Product

The 'low' and 'central' case scenarios, which differ in their assumptions about the new population and associated housing starts, have been used in this analysis to show the more likely range of effects. Results are presented in Table 21 against current predictions of performance of these indicators without the establishment of the ADATS plant. The economic effects are shown through the period to 1988, beginning with 1984 actual performance. Construction of the plant is assumed to take place in 1986. In 1987, the economic performance reflects the combined effects of the initiation of plant operations, and the additional 50 to 100 new housing starts.

The construction and operation of the plant provides a significant boost to employment. The result is a drop in the unemployment rate in 1986 of 0.2 per cent from the current forecast of 14.2 per cent to 14.0 per cent. This is the result of the 86 construction jobs and 41 other jobs generated through the construction of the ADATS plant.

In 1987, the unemployment rate shows a more substantial drop as 672 jobs are created, directly and indirectly related to the plant's operation. In addition, employment rises due to new housing starts. The total effect is to lower the unemployment rate by 1.3 per cent from the forecast level of 12.7 per cent to 11.4 per cent. This effect is sustained in future years to 1991. At this time, Phase II would further reduce unemployment, but to a lesser extent. Unemployment is estimated to decline an additional 1.5 per cent below the forecast level of 10.5 per cent of 9 per cent due to the plant.

The total effect on real Gross Provincial Product is substantial. GPP is currently forecast to rise by only 1.3 per cent in 1986 and by 2.5 per cent in 1987. The ADATS plant construction would add 0.4 per cent to GPP growth in 1986, raising it in total by 1.7 per cent over 1985 levels. In 1987, Phase I of the plant's operation and new housing starts would increase GPP growth by 0.9 per cent to 3.4 per cent in the low case, reflecting 50 additional new housing starts, and by 1.1 per cent to 3.6 per cent in the central case, based on 100 additional housing starts. Again, Phase II would add a further stimulus of 0.3 per cent in 1991 bringing the overall effect of the plant to between 1.2 and 1.4 per cent.

Real disposable income would similarly increase above the forecast levels of 0.2 per cent in 1986 and 2.0 per cent in 1987. In both the low and central cases, the plant construction would add 0.2

per cent to the growth of real disposable income, raising its growth by 0.4 percent. In 1987, real disposable income would grow by 1.2 per cent over forecast levels at 3.3 per cent in both cases. In 1991, Phase II would add an additional 0.3 per cent to the forecast 3.0 per cent growth, bringing the income growth rate in that year to 3.3 per cent.

When calculated on a per household basis, differences in the percentage growth of real disposable income on the 2 scenarios reflect the differences in assumptions for the number of new residents associated with the ADATS plant. The current forecast of real disposable income per household indicates a 1.2 per cent decline in 1986 over 1985 levels. This reflects the fact that for this year, household formation exceeds real income growth. Construction of the plant in 1986 will lessen the decline of growth to 0.9 per cent. In 1987, real disposable income is forecast to grow by 0.6 per cent. Phase I of plant operations and related economic activity will boost this growth by 1.2 per cent in the low case, to 1.8 per cent. In the central case, income per household will grow by 1.7 per cent, 1.1 per cent above forecast levels due to the larger population influx associated with the plant. Phase II would add 0.2 per cent to the forecast growth rate of 1.3 per cent, bringing it to 1.5 per cent.

In summary, the ADATS plant will have significant long term economic benefits to the Prince Edward Island economy, providing a large and direct stimulus to Gross Domestic Product and to manufacturing's share of output. By adding an important number of jobs, the plant would produce an unemployment rate lower than currently forecast and boost real incomes.

IX. CONCLUSION

The analysis of the benefits associated with the construction and operation of the proposed ADATS plant indicate that:

- The stimulus provided to the Provincial economy by Phase I will be very substantial, directly raising Gross Provincial Product in the order of 1 per cent above the expected growth trend for 1987. Moreover, the stimulus is not so large as to cause significant economic disruption.

- The unemployment rate will decrease sharply due to the large number of jobs created both at the plant and elsewhere in the economy.

- The high technology facility will provide high quality jobs for graduates from the Province's post-secondary institutions, particularly in engineering and engineering technology.

- While Equalization Entitlements will decline overall, by an estimated $3.3 to $5.8 million, it is further estimated that these will be more than offset by gains through taxation and other revenues. Phase I would stimulate most of this decline in 1987, ranging from $3.0 to $5.1 million, 2.4 to 4.1 per cent below 1985/86 levels.

- Importantly, the plant would provide a boost to the Province's manufacturing sector. As of 1982, manufacturing accounted for 6.5% of the Province's domestic product. The ADATS plant would be a significant addition to the manufacturing base, helping to diversify and restructure the economy and is consistent with government objectives to attract appropriate new industries to the Island. As a high tech industry, the ADATS plant is essentially a clean industry. The proposed plant would be a net addition to the

small base of other high technology industries already on the Island, which may improve the Island's attractiveness to additional high tech firms.

- The result is a decrease in the Province's dependence on Equalization Entitlements in the short term. P.E.I.'s Entitlements, on a per capita basis, are the second highest of all provinces (after Newfoundland). The recent Federal budget has indicated that the federal government wishes in the longer term (1990-91) to limit increases in Entitlements. The ADATS plant provides the Province with an opportunity to begin the process of restructuring the economy and boosting economic performance, which will cushion the effects of future changes in Entitlements on the Provincial Treasury.

- In total, the economic benefits are positive. The number of new plants of this nature and size, which are seeking a Maritimes location, is limited. This plant would therefore be an appropriate one for the government of Prince Edward Island to attract to the Province.

DETAILED CALCULATIONS OF CHANGES IN EQUALIZATION ENTITLEMENTS

This appendix describes the methodology used in estimating possible changes in P.E.I.'s equalization revenues arising from the establishment of the ADATS plant in the Province. In the fiscal year ended March 31, 1984, these payments amounted to 30.6 per cent of the Province's total government revenue. Consequently, it is worthwhile to enquire whether the establishment of the ADATS plant will significantly affect provincial revenues by affecting equalization entitlements.

The purpose of equalization entitlements is to ensure that reasonably similar levels of service are provided by provincial governments despite differences in income levels and population sizes among provinces. To accomplish this, a tax base is calculated for each province for thirty-nine tax and other revenue categories. A national average tax rate is applied to calculate the revenues that each province is theoretically capable of raising in each category. The per capita level of revenue-raising capacity is then compared with a five-province standard per capita yield and the deficiency, multiplied by provincial population, yields the equalization entitlement. Thus, each province receiving entitlements in a certain category brings its potential revenues up to the provincial standard.

The ADATS plant will affect both income and population in P.E.I., and hence equalization entitlements. Population and income are key factors which determine the revenues to the province from equalization payments. We have therefore estimated the change in entitlements that may arise if the plant is built in P.E.I.

The Federal-Provincial Relations Division of the federal Department of Finance produces estimates of Provincial fiscal equalization containing detailed calculations. The 1985-86 First Estimate provides a "base case" from which changes in entitlements have been calculated.

The approach taken to calculating changes in equalization entitlements consists of the following four steps:

- identify the most important categories of entitlement revenue for close study,
- use simplified versions of the entitlement calculations detailed by the federal government 1985-86 Estimates to derive changes in entitlements arising from changes in population and economic activity due to the operation of the ADATS plant,

- use the estimated percentage changes in tax yields in the above categories to calculate yield changes in other entitlement categories and

- add the entitlement changes thus estimated to derive the change in total entitlements.

Entitlement Categories

There are thirty-nine categories of government revenues for which equalization entitlements are currently calculated. Of these, six were identified as being both significant sources of entitlement revenue and likely to be affected by the plant's operations. These categories are:

- personal income tax,
- business income tax,
- general and miscellaneous sales taxes,
- hospital and medical insurance premiums,
- provincial-local property tax and
- miscellaneous provincial-local taxes.

There are an additional fourteen categories expected to be influenced by the economic impact of the plant's operation. These are:

- capital tax,
- tobacco tax,
- gasoline tax,
- diesel fuel tax,
- non-commercial vehicle licenses,
- commercial vehicle licenses,
- revenues from the sale of spirits,
- revenues from the sale of wine,
- revenues from the sale of beer,
- succession duties and gift taxes,
- race track taxes,
- insurance premium revenues,
- payroll taxes and
- lottery revenues.

The remaining nineteen categories will be influenced solely by changes in P.E.I.'s population due to the in-migration of workers to work at the ADATS plant and their families. These remaining categories are:

- forestry revenues,
- oil & gas revenues, (nine categories),

- mineral resources revenues, (six categories),
- water power rentals,
- shared revenues: undistributed income on hand and
- shared revenues: off-shore activities.

Thirty-three categories were examined, along with miscellaneous provincial-local taxes, after the other five categories in order to make use of information coming from these detailed estimates.

Detailed Studies

The six categories selected for close study constitute 82.0 per cent of total equalization entitlements for P.E.I. in the 1985-86 Estimates. The share in total entitlements of each category is as follows:

	Per Cent
• personal income tax	35.8
• business income tax	5.8
• general miscellaneous sales tax	13.1
• hospital and medical insurance premiums	2.6
• provincial-local property tax	16.7
• miscellaneous provincial local taxes	8.0
	82.0

The 1985-86 Estimates provide a Computation Table for each of the thirty-nine categories. It consists of a tax base calculation specific to individual categories and an entitlements calculation that applies uniformly to all categories. Each tax base is derived from data on levels of economic activity and population appropriate to the category being examined. Once the tax base is determined, entitlements are calculated in the manner described earlier. For each category a per capita yield deficiency, multiplied by provincial population, is the entitlement amount determined for the category.

For the six categories studied here (excluding miscellaneous provincial-local taxes) some simplification of the tax base calculation was used to calculate the change in entitlements. This was done to reduce the input data requirements, since the analysis of the impact of the ADATS plant upon the Provincial economy did not produce estimates of the changes in all the inputs to the Computation Tables. However, in all cases, a "base case" of zero changes was constructed to ensure that the simplified calculations of

the tax base produced results similar to those of the 1985-86 Estimates. The detailed calculations and the data inputs are described below.

The tax base calculation for miscellaneous provincial-local taxes differs from the other five categories, since it is a "catch-all". The tax base is determined by tax yields in twenty other categories, including the five others singled out for close study. Thus, the calculation of the change in miscellaneous provincial-local taxes is discussed in a subsequent section of this appendix.

The major sources of input data for the entitlements estimation process are as follows:

- the ADATS plant operator's estimates;
- the Inter-Provincial Input/Output Model estimates of operating phase impact and induced effects upon P.E.I. and
- Statistics Canada and Revenue Canada data.

As well, the small size of the project and of P.E.I.'s share of total entitlements makes it reasonable to assume that there will be no effect on either Canadian totals or the "standard provinces" yields which are the basis for calculating entitlements. Thus, only data pertaining directly to the P.E.I. economy were used.

The simplified tax base calculations and the subsequent entitlements calculations require the following data for P.E.I.:

- the change in:
  - population,
  - personal income tax payments,
  - corporate profits before taxes,
  - total retail sales,
  - the number of persons capable of paying full hospital and medical insurance premiums,
  - Net Provincial Income at factor cost and
  - non-residential capital stock.

Details on these inputs and their use appear below.

The data sources quoted above produced changes used as a "central case" in the entitlements change calculations. However, the calculations were

repeated using alternative values of the inputs above and below the "central case" to determine the sensitivity of entitlements' changes to variations in the input values. The range of variation in individual inputs is presented below.

(i) Personal Income Tax

The tax base calculations in the Estimates determines the share of Canadian total personal income taxes that is collected in P.E.I. This share is multiplied (in the entitlements' calculation) by total Canadian personal income taxes to produce P.E.I. tax yield. Much of the tax base calculation is "fine tuning" to adjust for distortions in share arising from Provincial tax credits. Since the simulations undertaken here are interested in the change in entitlements (and not the level), this "fine tuning" is not necessary and has been removed.

Two inputs are required for the calculation. The change in population from the base case is determined from the plant operator's information and data on average family size in P.E.I. The range of increase is estimated to be from 150 to 400 people, with the "central case" being 320. (The change in population is an input to all entitlements' categories.)

The change in basic federal personal income tax is calculated from the change in personal income estimated in the Input/Output Model. The Model's values are in 1985 dollars and were deflated by the CPI, All Items for Canada, to 1983 dollars, since 1983 dollars are used in the Estimates. The effective tax rate on this income is estimated to vary over the business cycle between 10.0 and 11.5 per cent. Allowing variations in income from the "central case" of plus or minus 10 per cent and applying the low tax rate to the low end and high tax rate to the high end of this range yields an interval of from $1.9 million to $2.7 million (1983) dollars. The "central case" of $2.3 million dollars reflects an effective tax rate of 10.75 per cent.

(ii) Business Income Tax

The tax base calculation determines P.E.I.'s Provincial corporate income from the Canada National Accounts total on the basis of tax model analysis. The change in corporate profits, in 1981 dollars, is the only input, in addition to population change, necessary to determine the change in entitlements. This input consists of an estimate of the ADATS plant's average profits plus the additional profit generated in other firms by the plant's operation. The 1985 dollar estimates are deflated by means of the GNE implicit price

deflator to 1981 dollars. The range of possible values is set by an allowance of ± 10 per cent for uncertainty of estimate and further broadened to allow for variability of profits during the business cycle. Values ranging from $3.8 to $7.4 million (1981) dollars were used in our calculations. The "central case" value was $5.9 million.

(iii) General and Miscellaneous Sales Taxes

The tax base calculation in the 1985-86 Estimates uses gross retail sales as an input and adjusts it by adding or subtracting sales for seven different commodities and services to get a tax base upon which sales and other taxes are levied. The ADATS plant calculation was simplified to make the change in retail sales the sole input, other than population change, by including a multiplication factor for adjustment based on the relationship between retail sales and tax base in the Estimates. (This multiplication factor is about 1.1 for P.E.I. in the 1985-86 estimates.)

Retail sales margins' contributions to P.E.I.'s final demand in the Input/Output Model's runs were divided by a range of margin rates to produce estimates of retail sales. These were compared with independent forecasts of retail sales for P.E.I., with and without the ADATS plant, for the period to 1988. This comparison narrowed the plausible range of sales figures to between $7 and $16 million dollars. The sales forecast was done in constant 1983 dollars to be compatible with the Estimates.

(iv) Hospital and Medical Insurance Premiums

The tax base calculation in the Estimates determines the number of persons capable of paying full premiums for medical care insurance. The Input/Output Model generated data on the amount of full-time employment that the ADATS plant is likely to directly create and indirectly induce. These data, together with census information on the proportion of working age males in P.E.I. who are married, provided an estimate of the change in the number of persons capable of paying full premiums. The resulting estimate of premium payers does not depend on the change in P.E.I.'s population since new full-time employees may come from part-time status or from outside the labour force without affecting population. The range of values chosen for study is based on an allowance for uncertainty of ± 10 per cent in the full-time equivalent increase and on "married" rate variability between 55 and 65 per cent. The range of new premium payers is between 1,256 and 1,634 persons with a "central case" level of 1441.

(v) Provincial-Local Property Tax

The tax base calculation in the Estimates computes the value of residential and non-residential capital stocks and land. To estimate the effect of the ADATS plant, the existing values in the Estimates have been augmented with changes calculated from various sources. Residential capital stock is formulated to change in proportion to population. (This is somewhat conservative since even without any increase in population, existing housing will be improved if incomes rise.) Non-residential capital stock is augmented by the full value of the ADATS plant and by estimates of the indirect effect on capital stock due to demand for inputs to the ADATS plant and to the general increase in Gross Provincial Product above the trend forecast for P.E.I. without the plant. All capital stock values are deflated to 1983 dollars by the GNE implicit price deflator for Canada.

The range of variation in residential capital stock depends upon the range of variation in population change. The range for non-residential capital stock is determined by the variability of construction investment in GNP and the effect that this variability will produce on capital stock over time. The change in non-residential capital stock is limited to a range of $5.4 to $12.0 million 1983 dollars, with a "central case" value of $9.0 million.

The value of land is derived in the Estimates from the value of Net Provincial Income (NPI) at factor cost in constant 1971 dollars over the five years preceding the year for which the land tax base is calculated. To estimate the effect of the ADATS plant, the change in NPI for a "typical" year of plant operations derived from the Input/Output Model results is applied to all five years. The GNE implicit price deflator is used to convert 1985 dollars from the Input/Output results to 1971 dollars.

The range of values is set by an allowance of $\pm$ 10 per cent for uncertainty and possible variation in one component of NPI (profits), which had to be estimated as a share of a value ("other operating surplus") in the Input/Output results. The change in NPI for one year is limited to a range of $7.9 to $9.9 million 1971 dollars, with a "central case" value of $8.8 million.

(vi) Miscellaneous Provincial-Local Taxes

The tax base calculated in the Estimates is the sum of the yields of twenty entitlement categories, as noted previously. The detailed studies of the five categories discussed above provide estimates of the

percentage change in the yield for each category due to the operation of the ADATS plant. These percentage changes are applied to the yield values of the "base case" in the Estimates for these five categories. Another fourteen categories are hypothesized to experience percentage changes in their yields proportional to the percentage change in yield of one of the categories given detailed study or to the percentage change in P.E.I.'s population. Thus, of the fourteen categories, twelve use the percentage change in the yield on personal income, one (capital taxes) uses business income and one (succession duties) uses population. The final category (shared revenues: undistributed income on hand) is always zero.

The sum of the new yield values of the twenty categories is the tax base upon which the standard equalization calculation is performed for the Miscellaneous Provincial-Local taxes category. The range of variation in entitlements here is determined by the range of variation in yields in the other detailed studies and by the range of variation in population.

Total Equalization Entitlements

The calculation of the entitlement for each equalization category involves multiplying the difference between the per capita yield of the "Standard Provinces" and the per capita yield of P.E.I. by the Province's population. The Standard Provinces' per capita yields are fixed for this study.

The twenty percentage changes in yields calculated above for P.E.I. are applied to the "base case" yield values for these categories. This occurs for Miscellaneous Provincial-Local Taxes as well. All other categories' yields are zero for P.E.I. (with the exception of the Mineral Resources - Other category, whose yield is small and is left at its original value). A small change in entitlement levels occurs for those categories with zero P.E.I. yields due entirely to the increase in population. The categories with non-zero yields experience yield changes which produce noticeable changes in entitlements. (These entitlements are influenced by population change as well.)

Finally, equalization entitlements are added across all categories to get the total for P.E.I. The difference between the new total and the "base case" value is the change in a "typical year" in equalization entitlements due to the establishment of the ADATS plant.